

UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
OAKLAND DIVISION

APPLIED SIGNAL TECHNOLOGY, INC.,

Plaintiff,

vs.

EMERGING MARKETS  
COMMUNICATIONS, INC., et al.,

Defendants.

Case No: C 09-2180 SBA

**PATENT CLAIM CONSTRUCTION  
ORDER**

AND RELATED ACTIONS.

On January 20, 2011, the Court conducted a claims construction hearing with respect to the patents-in-suit. Each party appeared through counsel of record. Upon consideration of the parties' arguments, claim construction briefs, and the evidence presented, the Court construes the disputed claim terms as set forth below.<sup>1</sup>

**I. BACKGROUND**

On May 18, 2009, Applied Signal Technology, Inc. ("AST") filed this patent infringement action against Defendants Emerging Markets Communications, Inc. ("EMC"), ViaSat, Inc. ("ViaSat"), and ViaSat's licensee Paradise Datacom, LLC ("Paradise"). AST asserts infringement of the following patents: U.S. Patent No. 6,859,641 ("641 Patent"), entitled "Adaptive Cancellor for Frequency Reuse Systems," and U.S. Patent No. 7,228,104 ("104 Patent"), also entitled "Adaptive Cancellor for Frequency Reuse Systems." On June 12,

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<sup>1</sup> By Order dated August 12, 2010, the Court excused Defendants Emerging Markets Communications, Inc. and EMC Satcom Technologies, Inc. from further litigating this matter due to a settlement in principal reached during the July 22, 2010 settlement conference. Dkt. 153. Therefore, only Applied Signal Technology, Inc., Comtech EF Data Corp., ViaSat, Inc., and Paradise Datacom, LLC have participated in the claim construction process.

2009, AST filed a First Amended Complaint, adding Defendant EMC Satcom Technologies, Inc. (“EMC Satcom”).

On October 15, 2009, Defendant ViaSat filed an Answer, in which it asserted counterclaims for patent infringement against AST of the following ViaSat patents: U.S. Patent No. 6,907,093 (“‘093 Patent”), entitled “Method and Apparatus for Relayed Communication Using Band-Pass Signals for Self-Interference Cancellation,” and U.S. Patent No. 6,725,017 (“‘017 Patent”), entitled “Multi-Channel Self Interface Cancellation Method and Apparatus for Relayed Communication.”

On May 14, 2010, Defendant ViaSat filed a First Amended Answer, adding an additional patent to its counterclaims against EMC, specifically, U.S. Patent No. 6,011,952 (“‘952 Patent”), entitled “Self-Interference Cancellation for Relayed Communication Networks.” ViaSat also added claims of infringement of the ViaSat Patents (the ‘093, ‘017, and ‘952 Patents) against Third Party Defendant Comtech EF Data Corp. (“Comtech”), a licensee of AST.

AST and Comtech are collectively referred to herein as “AST,” and ViaSat and Paradise are collectively referred to herein as “ViaSat.”

## **II. LEGAL STANDARDS**

### **A. OVERVIEW**

A patent confers the right to exclude others from making, using, or selling the invention defined by the patent’s claims. Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448, 452 (Fed. Cir. 1985). A patent must describe the exact scope of an invention and its manufacture to secure to a patentee all to which he is entitled, and to apprise the public of what is still open to them. Markman v. Westview Instruments, 517 U.S. 370, 373 (1996). These objectives are served by two distinct elements of a patent document. First, it contains a specification describing the invention in such full, clear, concise, and exact terms as to enable any person skilled in the art to make and use the same. 35 U.S.C. § 112. Second, a patent includes one or more claims, which particularly point out and distinctly claim the subject matter which the applicant regards as his or her invention. Id.

1 The first step in any invalidity or infringement analysis is claim construction. See  
2 Union Oil Co. v. Atlantic Richfield Co., 208 F.3d 989, 995 (Fed. Cir. 2000). The construction  
3 of claims is simply a way of elaborating the normally terse claim language in order to  
4 understand and explain, but not to change, the scope of the claims. See id. Claim construction  
5 is a matter of law to be determined by the court. Markman, 52 F.3d at 979.

6 **B. INTRINSIC EVIDENCE**

7 The claim language, specification, and prosecution are collectively referred to as  
8 “intrinsic evidence.” When the intrinsic evidence is unambiguous, it is improper for the Court  
9 to rely on extrinsic evidence, i.e., expert testimony, inventor testimony, dictionaries, and  
10 technical treatises. Mantech Envtl. Corp. v. Hudson Envtl. Servs., 152 F.3d 1368, 1373 (Fed.  
11 Cir. 1998).

12 There is a hierarchy for various types of intrinsic evidence. First, “a trial court [. . .]  
13 looks to the words of the claims themselves.” Vitronics Corp. v. Conceptronic, Inc., 90 F.3d  
14 1576, 1582 (Fed. Cir. 1996). Words in a claim are generally given their ordinary and  
15 customary meaning as understood by one of ordinary skill in the art. Id.

16 In some cases, the ordinary meaning of claim language as understood by a person of  
17 skill in the art may be readily apparent even to lay judges, and claim construction in such cases  
18 involves little more than the application of the widely accepted meaning of commonly  
19 understood words. Brown v. 3M, 265 F.3d 1349, 1352 (Fed. Cir. 2001) (holding that the  
20 claims did “not require elaborate interpretation”). In such circumstances, general purpose  
21 dictionaries may be helpful.

22 In many cases, however, determining the ordinary and customary meaning of the claim  
23 requires examination of terms that have a particular meaning in a field of art. Phillips v. AWH  
24 Corp., 415 F.3d 1303, 1314 (Fed. Cir. 2005). In these circumstances, dictionaries – although a  
25 form of extrinsic evidence – may be considered by the Court in determining the meaning of  
26 patent claim terms, provided the dictionary definition does not contradict any definition found  
27 in or ascertained by a reading of the patent documents. See Kopykake Enterprises, Inc. v.  
28 Lucks Co., 264 F.3d 1377, 1282 (Fed. Cir. 2001).

1        There is a “heavy presumption” that the claims mean what they say. Tex. Digital Sys.,  
2 Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202 (Fed. Cir. 2002). If, however, the meaning of the  
3 disputed term is not obvious from reading the claims, the Court may look to the specification  
4 and the prosecution history to interpret them. Vitronics, 90 F.3d at 1582. The specification  
5 contains a written description of the technical problem faced by the inventor and how the  
6 inventor solves the problem, as well as drawings. Id. Claims must be read in view of the  
7 specification, of which they are a part, see Markman, 52 F.3d at 979-980, but it is improper to  
8 “read a limitation from the written description into the claims.” Comark Communications, Inc.  
9 v. Harris Corp., 156 F.3d 1182, 1186 (Fed. Cir. 1998); see also SciMed Life Systems, Inc. v.  
10 Advanced Cardiovascular Systems, Inc., 242 F.3d 1337, 1340 -1341 (Fed. Cir. 2001).

11        The prosecution history contains the complete record of the proceedings before the  
12 United States Patent and Trademark Office (“USPTO”), and may include express  
13 representations made by the applicant regarding the scope of the claims. See Vitronics, 90  
14 F.3d at 1582.

### 15        C.        EXTRINSIC EVIDENCE

16        In most cases, an examination of the intrinsic evidence will be sufficient to resolve any  
17 ambiguity in the disputed claim and it would be improper to rely on extrinsic evidence. Id. at  
18 1583. Extrinsic evidence may be used to define the claim only if the claim language remains  
19 “genuinely ambiguous” after consideration of the intrinsic evidence. Id. However, “it is  
20 entirely appropriate, perhaps even preferable, for a court to consult trustworthy extrinsic  
21 evidence to ensure that the claim constructions it is tending to from the patent file is not  
22 inconsistent with clearly expressed, plainly apposite, and widely held understandings in the  
23 pertinent technical field.” AFG Indus., 239 F.3d at 1249 (quoting Pitney Bowes, Inc. v.  
24 Hewlett-Packard, Co., 182 F.3d 1298, 1309 (Fed. Cir. 1999)).

25        When “the specification explains and defines a term used in the claims, without  
26 ambiguity or incompleteness, there is no need to search further for the meaning of the term.”  
27 ATD Corp. v. Lydall, Inc., 159 F.3d 534, 540 (Fed. Cir. 1998) (citing Fed. R. Evid. 702-706;  
28 Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1478 (Fed. Cir. 1998)). However,

1 when such definition is challenged it is often appropriate, despite facial clarity and sufficiency  
2 of the specification and the prosecution history, to receive evidence of the meaning and usage  
3 of terms of art from persons experienced in the field of the invention. Id. The Court may hear  
4 all relevant testimony – including expert testimony – so long as it does not accord weight to  
5 expert testimony which contradicts the clear language of the claim. See Vitronics, 90 F.3d at  
6 1584.

#### 7 **D. MEANS-PLUS-FUNCTION**

8 The sixth paragraph of 35 U.S.C. § 112 states that claim language presented in a means-  
9 plus-function format “shall be construed to cover the corresponding structure, material, or acts  
10 described in the specification and equivalents thereof.” Construction of a means-plus-function  
11 limitation involves two steps. Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc., 296 F.3d  
12 1106, 1113 (Fed. Cir. 2002). First, the Court must identify the claimed function. Id. The  
13 Court must construe the function of a means-plus-function limitation to include the limitations  
14 contained in the claim language, and only those limitations. Id. It is improper to narrow the  
15 scope of the function beyond the claim language. Id. It is equally improper to broaden the  
16 scope of the claimed function by ignoring clear limitations in the claim language. Id. Ordinary  
17 principles of claim construction govern interpretation of the claim language used to describe  
18 the function. Id.

19 After identifying the claimed function, the Court must then determine what structure, if  
20 any, disclosed in the specification corresponds to the claimed function. Id. In order to qualify  
21 as corresponding, the structure must not only perform the claimed function, but the  
22 specification must clearly associate the structure with performance of the function. Id. This  
23 inquiry is undertaken from the perspective of a person of ordinary skill in the art. Id. If,  
24 however, this inquiry reveals that no embodiment discloses corresponding structure, the claim  
25 is invalid for failure to satisfy the definiteness requirement of 35 U.S.C. § 112, ¶ 2. Id. at 1114.

#### 26 **III. THE ‘641 AND ‘104 PATENTS (“THE AST PATENTS”)**

27 The ‘104 Patent is a continuation of the ‘641 Patent, and thus includes the identical  
28 specification and drawings as the ‘641 Patent. Both patents relate to “self-interference

cancellation” methods and systems that can be used to increase bandwidth in a satellite communications system. The Court’s constructions of the disputed claim terms are set forth below.

**A. “ESTIMATING”**

Term	AST’s Construction	ViaSat’s Construction
“estimating”	Determining approximate values <sup>2</sup>	Using a Fourier transform to determine approximate values

The primary dispute between the parties is whether the “estimating” step should be limited to the use of a Fourier transform. AST argues that ViaSat’s proposed construction improperly reads limitations from the specification into the claims. See Phillips, 415 F.3d at 1313 (warning against importing limitations from specification and noting that although the specification often describes very specific embodiments of the invention, courts repeatedly warn against confining the claims to those embodiments).

In particular, AST argues that the AST Patents teach using a Fourier transform as a technique in correlating signals to calculate an initial delay and frequency offset. According to AST, while this is one way to estimate, nowhere in the specification do the inventors limit the process of “estimating” to methods employing Fourier transforms. AST also notes that the patents describe the use of Fourier transforms in the initial calculations of delay and frequency to be only a preferred method: “[t]his correlation [used in the estimation process] is preferably implemented using discrete time fast Fourier transforms (FFT) for the calculation of the ambiguity function ....” ‘641 Patent, 9:16-20 (bracketed material added). Thus, AST asserts that limiting the term “estimating” to using Fourier transforms violates the axiom that claims are not limited to the preferred embodiment. See RF Decl., Inc. v. Pac. Keystone Techs., Inc., 326 F.3d 1255, 1263 (Fed. Cir. 2003) (“claims are not necessarily and not usually limited in scope simply to the preferred embodiment”).

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<sup>2</sup> At the claim construction hearing, AST changed its proposed claim construction to the plain and ordinary meaning of this term.

1 In response, ViaSat argues that its construction is proper under the “exception” to the  
2 general principle that limitations from the specification should not be read into the claims.  
3 Specifically, ViaSat argues that, when the specification describes a particular feature as “the  
4 invention” or stresses its importance in distinguishing over the prior art, then the claims should  
5 be limited to that feature. Here, ViaSat asserts that the goals of the invention are to minimize  
6 computational time and reduce complexity and that these goals are accomplished by “the  
7 invention” by employing a Fourier transform. See ‘641 Patent, 13:6-10.

8 ViaSat’s assertion – that the AST Patents make clear that the disclosed estimating  
9 process is “the invention” – is incorrect. Of note, claims 1 and 24 of the ‘641 Patent and claims  
10 1 and 18 of the ‘104 Patent (all independent claims) do not include the “estimating step” or  
11 even use the term “estimating.” Thus, estimating cannot be characterized as “the invention” of  
12 the AST Patents. Also, the USPTO’s Notice of Allowability for each patent, which includes  
13 the examiner’s statement of reasons for allowance, does not state that the estimating limitation  
14 was considered to be the invention. Rather, the USPTO referred to the tracking of variations in  
15 signal parameters, which includes controlling the tracking with an error signal, as the feature  
16 distinguishing the prior art. See Dkt. 196-1, Breit Decl., Exs. 1 and 2. Thus, the estimating  
17 step is a preliminary step to the important “tracking” feature of the invention.

18 ViaSat is also incorrect in asserting that the patent specification teaches that Fourier  
19 transforms are the key – and only – technique for performing the estimation step. The  
20 specification never limits estimating to the use of Fourier transforms. Rather, it states that the  
21 estimation unit “may” employ “a complex correlation,” but the complex correlation is only  
22 “preferably implemented” using the Fourier transform:

23 The initial delay and frequency estimation unit 106 may employ a known  
24 ambiguity processing algorithm, such as described by S. Stein [citation omitted].  
25 This algorithm basically provides an efficient approach for performing a  
26 complex correlation between two input signals over a range of delays and  
27 frequencies. ... This correlation is preferably implemented using discrete time  
28 fast Fourier transforms (FFT) for the calculation of the ambiguity function to  
minimize the computational requirements and, hence, the processing time, as  
will be described.



‘641 Patent, 9:5-20 (emphasis added). Moreover, while the specification does not specifically describe any alternative methods to the Fourier transform, the Federal Circuit has stated “we have expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment.” Phillips, 415 F.3d at 1323.

In sum, the Court finds that the ‘641 and ‘104 Patents do not limit the claim term “estimating” to the use of Fourier transforms, or otherwise depart from the plain and ordinary meaning of this term. Therefore, the Court finds that the plain and ordinary meaning of the term “estimating” applies, and this claim term requires no further construction. See Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc., 249 F.3d 1341, 1349 (Fed. Cir. 2001) (the term “melting” did not require construction by the court when it did not depart from its ordinary meaning).<sup>3</sup>

#### B. “TRACKING VARIATIONS”

Term	AST’s Construction	ViaSat’s Construction
“tracking variations”	Making adjustments to minimize differences	Adaptively filtering delay and correcting frequency <sup>4</sup>

<sup>3</sup> In a footnote to its opening claim construction brief, AST requests that the Court add the following bracketed language to the “estimating” step in claim 14 of the ‘641 Patent: “estimating first offsets corresponding to coarse delay and frequency differences between the [replica of the] transmitted signal and the interfering signal.” AST asserts that it discovered during this litigation that this language should be included in the claim. The Federal Circuit has stated that “the district court can correct only *Essex*-type errors.” Novo Industries, L.P. v. Micro Molds Corp., 350 F.3d 1348, 1357 (Fed. Cir. 2003) (citing I.T.S. Rubber Co. v. Essex Rubber Co., 272 U.S. 429 (1926)). *Essex*-type errors are “obvious errors,” where the error is “apparent from the face of the patent.” *Id.* at 1355, 1357 (“where the error is not evident from the face of the patent itself, as it was in *Essex*, it is important that the PTO bring its expertise to bear and consider whether such a correction is appropriate”). Here, it is not clear from the face of the patent that the “transmitted signal” in the “estimating” step necessarily means the “replica of” the transmitted signal, such that *Essex* applies. Therefore, the Court DENIES AST’s request.

<sup>4</sup> At the claim construction hearing, ViaSat offered as an alternative proposed construction that the Court adopt the plain and ordinary meaning of this term.



1 The primary dispute between the parties is whether the “tracking variations” step is  
2 limited to “adaptively filtering delay.”

3 AST’s construction is supported by the claim language. Specifically, the term “tracking  
4 variations” appears in claim 1 of the ‘641 Patent as follows:

5 tracking variations in delay, frequency offset and frequency dependent gain and  
6 phase variation between the interfering signal and the sample of the transmitted  
signal to produce a compensating signal ...

7 The term also appears in claim 14 of the ‘641 Patent:

8 tracking variations in delay, frequency, amplitude and phase offset between the  
9 first compensated replica and the interfering signal to produce a second  
compensated signal ...

10 Similarly, the term appears in claim 1 of the ‘104 Patent:

11 tracking variations in predetermined signal parameters resulting from relaying  
12 the transmitted signal between the interfering signal and the replica of the  
13 transmitted signal to produce a compensation signal ...

14 As noted by AST, while the term “tracking” in common parlance often refers to “following,” in  
15 the AST Patents this term means determining the differences (i.e., “variations”) in signal  
16 parameters between the two indicated signals and making adjustments to “produce a  
17 compensation signal.”

18 AST’s construction is also supported by the specification. The specification teaches a  
19 first step of applying the initial delay and frequency differences determined through the  
20 estimating step to produce an initial compensated replica of the transmitted signal. ‘641 Patent,  
21 3:39-43. Then, the patents describe the refinement of the compensated replica obtained  
22 through the tracking process. *Id.* 3:43-48; 3:64-67; 3:44-47. In sum, the specification  
23 describes a process whereby the initial or first compensating signal is generated through the use  
24 of offsets corresponding to delay and frequency. The process then tracks variations in coarse  
25 offsets to produce a second, more accurate, compensating signal, which is continually adjusted  
26 and combined with the received (or composite) signal to cancel the interfering signal.

27 On its face, ViaSat’s proposed construction – “adaptively filtering delay and correcting  
28 frequency” – is inconsistent with a number of the independent claims of the ‘641 Patent. For

1 instance, claim 14 recites “tracking variations in delay, frequency, amplitude, and phase offset  
2 ....” (Emphasis added.) Claim 1 recites “tracking variations in delay, frequency offset and  
3 frequency dependent gain and phase variation ....” (Emphasis added.) ViaSat’s construction  
4 omits claim language requiring the tracking amplitude and phase, and on that basis must be  
5 rejected. See Bicon, Inc. v. Straumann Co., 441 F.3d 945, 950 (Fed. Cir. 2006) (“claims are  
6 interpreted with an eye toward giving effect to all terms in the claim”); Unique Concepts, Inc.  
7 v. Brown, 939 F.2d 1558, 1563 (Fed. Cir. 1991) (“When the language of a claim is clear ... and  
8 a different interpretation would render meaningless express claim limitations, we do not resort  
9 to speculative interpretation based on claims not granted.”). In response, ViaSat argues that its  
10 claim construction simply sets forth the minimum requirement – that tracking must require  
11 adaptively filtering delay and correcting frequency – and that “tracking” of amplitude and  
12 phase can also be performed. However, ViaSat has failed to cite any authority to support its  
13 contention that claim construction involves setting out merely “minimum features” of the claim  
14 language.

15 ViaSat’s reliance on the specification is also not compelling. In particular, ViaSat  
16 argues that the AST patents stress that adaptively filtering the delay is crucial for the invention.  
17 But, nowhere does the patent state an adaptive filter is “crucial.” In fact, the passage relied  
18 upon by ViaSat merely states: “continual fine adjustments are required to maximize the  
19 cancellation.” ‘641 Patent, 8:63-65. The passage then describes in the preferred embodiment  
20 the digital phase lock loop provides fine adjustments and tracking of the frequency differences  
21 “while the fine delay, amplitude and phase adjustments are most efficiently handled via the  
22 adaptive FIR [finite impulse response ] filter 120 rather than the delay 120 ....” Id. 8:67-9:1  
23 (bracketed material added). The adaptive filter, in other words, is not described as crucial;  
24 instead, it is described as the “most efficient” way to handle fine adjustments. Of note, it  
25 appears from the specification that another structure is also disclosed that can perform delay  
26 tracking – specifically, delay unit 120 (in conjunction with delay tracking unit 108): “Delay  
27 unit 102 may comprise a memory that tracks the changing satellite link delay caused by  
28 Doppler. Preferably, the delay unit is used for coarse delay tracking, to within a sample.” Id.

10:51-54. Thus, an adaptive filter is not the only disclosed embodiment for delay “tracking.” Even if ViaSat were correct that only one embodiment of tracking is disclosed, ViaSat again violates the basic precept that “the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using ‘words or expressions of manifest exclusion or restriction.’” Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906 (Fed. Cir. 2004). Such words or expressions were not used by the ‘641 and ‘104 Patents. Furthermore, because the ‘641 and ‘104 Patents depart from the common meaning of “tracking,” in the sense that this term often refers to “following,” the Court finds that the plain and ordinary meaning does not apply, and further construction of this term is required.

For these reasons, the Court adopts AST’s proposed construction for “tracking variations” and construes this term as follows: “making adjustments to minimize differences.”

**C. “GENERATING AN ERROR SIGNAL FROM THE SIGNAL OF INTEREST”**

Term	AST’s Construction	ViaSat’s Construction
“generating an error signal from the signal of interest”	Generating an error signal from the signal of interest, where the signal of interest is the output of the combining step	Plain and ordinary meaning; no construction required

AST asserts that, while “the meaning of this claim limitation is clear when the claim language is reviewed in light of the intrinsic evidence ... a slight ambiguity is present in the claims because the inventors use the term ‘signal of interest’ in two closely related but somewhat different ways, including in claims 11 and 14 ....” Dkt. 175, AST’s Opening Br. at 19. According to AST, in one use, the term refers to the isolated desired signal (i.e., the “signal of interest” recited in the preamble); in a second use, it refers to the output signal of the “combining” step (and the input signal to this “generating an error” step), which includes both the desired signal (i.e., “signal of interest”) and uncanceled components of the interfering signal. Therefore, AST asserts that the construction of this limitation should clarify that the “signal of interest” is the output of the combining step. At bottom, AST seeks a construction that makes clear that the output of the “combining step” (and the input of the “generating an

1 error” step) includes both the signal of interest and uncanceled components of the interfering  
2 signal (in essence, it is asking for a construction of the term “signal of interest” in the  
3 “generating an error” step that is different from the “signal of interest” recited in the preamble).  
4 However, the claim language simply states that the “signal of interest” is the sole input to the  
5 generating step, i.e., “generating an error signal from the signal of interest.” (Emphasis added.)

6 In support of its argument, AST asserts that “signal of interest” is used in two different  
7 ways in the claims and specification of the AST Patents. Federal Circuit authority states that  
8 “the same word appearing in the same claim should be interpreted consistently.” Digital  
9 Biometrics, Inc. v. Identix, Inc., 149 F.3d 1335, 1345 (Fed. Cir. 1998). “Nevertheless, we have  
10 also recognized that a patent’s written description can set forth more than one definition of a  
11 claim term.” Pitney, 182 F.3d at 1310. Specifically, “[i]n circumstances ... where the  
12 language of the written description is sufficient to put a reader on notice of the different uses of  
13 a term, and where those uses are further apparent from publicly-available documents  
14 referenced in the patent file, it is appropriate to depart from the normal rule of construing  
15 seemingly identical terms in the same manner.” Id. at 1311.

16 AST has not shown that such circumstances exist here warranting an interpretation of  
17 “generating an error” that would imply that there are two different meanings for the term  
18 “signal of interest.” First, nothing in the language of claims 14 and 11 indicates that “signal of  
19 interest” has two different meanings. The “combining” step states: “combining the second  
20 compensated signal and the received signal to cancel at least in part the interfering signal and  
21 produce the signal of interest.” This element, read in light of the preamble, is perfectly  
22 consistent. Indeed, the invention is designed to produce the desired signal, or the signal of  
23 interest, and that is achieved as a result of the combining step.

24 The specification does not contradict this conclusion. It states: “An error signal  
25 representing any uncanceled components of the interfering signal in the signal of interest is  
26 generated from the signal of interest, and used to control the tracking to minimize offsets  
27 between the compensating signal and the interfering signal.” ‘641 Patent, 3:27-30 (emphasis  
28 added.) It further states: “The baseband digital processing system 80 provides delay and

frequency tracking, as well as adaptive filtering and cancellation .... The output from the baseband digital processing system is the compensated signal of interest from which the interfering uplink signal has been cancelled.” *Id.* 7:7-10 (emphasis added). Finally, it makes clear: “The output of combiner 122 ideally will contain only the signal of interest.” *Id.* 10:18-20.

In sum, AST has failed to establish that there is any ambiguity in the patents’ use of the term “signal of interest.” Therefore, the Court declines to construe the phrase “generating an error signal from the signal of interest” in the manner requested by AST, which would imply that the term “signal of interest” has two meanings. Rather, the Court agrees with ViaSat and finds that the plain and ordinary meaning applies, and this claim term requires no further construction.

#### **IV. THE ‘952, ‘093, AND ‘017 PATENTS (“THE VIASAT PATENTS”)**

Like the AST Patents, the ViaSat Patents relate to “self-interference cancellation” that can be used to increase bandwidth in a satellite communications system.

##### **A. THE ‘952 PATENT**

##### **1. “ESTIMATING CHANNEL CHARACTERISTICS ...”<sup>5</sup>**

Term	AST’s Construction	ViaSat’s Construction
“estimating channel characteristics of a roundtrip path to said relay station to obtain compensation parameters for said first one of said signalling devices”	Determining approximate values of the four channel characteristics (delay, frequency, phase, and gain) to obtain compensation parameters for the first signalling device and specifically excluding the use of adaptive filters	Determining approximate values of the four channel characteristics (delay, frequency, phase, and gain) to obtain compensation parameters for the first signalling device

The primary dispute between the parties is whether this “determining step” specifically excludes use of “adaptive filters,” as AST has proposed. AST argues that this exclusion is proper based on the specification of an earlier-filed patent – U.S. Patent No. 5,596,439 (“the

<sup>5</sup> Several of the disputed terms appear in both method claim format and means-plus-function format. The parties have provided consistent proposed constructions for each format.

1 ‘439 Patent”) – which is incorporated by reference into the ‘952 Patent. The ‘439 Patent is not  
2 at issue in this action, and is not a “parent” or “familial” patent to the ‘952 Patent. However,  
3 both patents have the same inventors and both are assigned to ViaSat.

4 AST’s argument is premised on the following factors. First, AST notes that the ‘952  
5 Patent incorporates the ‘439 Patent by reference, in stating that:

6 A device, such as the one disclosed in the applicant’s U.S. Pat. No. 5,596,439,  
7 located at the more capable station uses this knowledge to help estimate:

8 The round-trip propagation delay to and from the relay station; and

9 Relative signal amplitude, carrier frequency and phase (if applicable to the  
10 selected modulation waveform) of the relayed source signal vs. the a priori  
known source signal.

11 ‘952 Patent, 2:42-50 (emphasis added).

12 Next, AST asserts that the ‘439 Patent “disavowed” use of adaptive filters in its  
13 invention. Specifically, the ‘439 Patent acknowledges that in prior art telephony systems,  
14 echoes are removed using echo cancellers that employ adaptive filters. ‘439 Patent, 2:3-9.  
15 Noting the difference in application between prior art telephony systems and the relayed  
16 communications systems of the ‘439 Patent, the ‘439 Patent states:

17 Because the [telephony] signal is not relayed and there [is] no frequency offset  
18 between the transmit and receive signals, the echo canceller can be implemented  
19 using an adaptive filter approach. The coefficients of the filter can be estimated  
20 using any one of a number of well-known algorithms such as the LMS (least-  
21 mean-square) algorithm. However, this approach cannot be extended to the case  
22 of a relayed communication system in which the transmitting and receiving  
frequencies are significantly different. Thus, a different cancellation technique  
must be employed in order for relayed signals to be able to share the same  
bandwidth.

23 ‘439 Patent, 2:6-14 (emphasis added).

24 Also, AST observes that the ‘952 Patent does not otherwise disclose the use of adaptive  
25 filters in the “estimating step.” Lastly, AST cites Cook Biotech Inc. v. Acell, Inc., 460 F.3d  
26 1365, 1377 (Fed. Cir. 2006), wherein the Federal Circuit, in interpreting a claim term of the  
27 ‘389 patent, found that the ‘508 patent was expressly incorporated into the ‘389 patent, the  
28 ‘508 patent’s specification defined a term, and as such, the ‘389 patent incorporated the ‘508

1 patent's definition of that term. It follows, according to AST, that the inventors of the '952  
2 Patent disavowed use of adaptive filters in the "estimating" step.

3 The Court disagrees. The '952 Patent does not limit the "estimating" step to the use of  
4 the device disclosed in the '439 Patent. Rather, it states that "[a] device, such as the one  
5 disclosed in the applicant's U.S. Pat. No. 5,596,439" can be used to "help estimate ...." '952  
6 Patent, 2:42-50 (emphasis added). This is not an "expression[s] of manifest exclusion or  
7 restriction, representing a clear disavowal of claim scope." See Teleflex, Inc. v. Ficosa North  
8 America Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002) ("The patentee may demonstrate an  
9 intent to deviate from the ordinary and accustomed meaning of a claim term by including in the  
10 specification expressions of manifest exclusion or restriction, representing a clear disavowal of  
11 claim scope.").

12 Therefore, the Court adopts ViaSat's proposed construction for "estimating channel  
13 characteristics ... " and construes this term as follows: "determining approximate values of the  
14 four channel characteristics (delay, frequency, phase, and gain) to obtain compensation  
15 parameters for the first signalling device."

16 **2. "MEANS ... FOR ESTIMATING CHANNEL**  
17 **CHARACTERISTICS ..."**

18 Term	AST's Construction	ViaSat's Construction
19 "means at said first one of said 20 signalling devices for 21 estimating channel 22 characteristics of a roundtrip 23 path to said relay station to 24 obtain compensation 25 parameters for said first one of 26 said signalling devices"	27 <u>Claimed function</u> : estimating channel characteristics of a roundtrip path to the relay station to obtain compensation parameters for the first one of the signalling devices  <u>Construction of function (no dispute)</u> : determining approximate values of the four channel characteristics (delay, frequency, phase, and gain) to obtain compensation parameters for the first signalling device	28 <u>Claimed function</u> : estimating channel characteristics of a roundtrip path to said relay station to obtain compensation parameters for said first one of said signalling devices  <u>Construction of function (no dispute)</u> : determining approximate values of the four channel characteristics (delay, frequency, phase, and gain) to obtain compensation parameters for the first signalling device



Term	AST's Construction	ViaSat's Construction
	<u>Structure</u> : Insufficient; in any event must exclude use of adaptive filters	<u>Structure</u> : self-interference cancellation device 112, including any I/O ports

The primary disputes between the parties are whether (1) a sufficient structure is disclosed for the claimed function and (2) whether that structure, if it exists, excludes adaptive filters. The parties do not dispute the construction of the claimed function.<sup>6</sup>

With respect to structure, “[i]n order to qualify as corresponding, the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function.” JVW Enter., Inc. v. Interact Accessories, Inc., 424 F.3d 1324, 1332 (Fed. Cir. 2005). Here, ViaSat relies on the following passages from the ‘952 Patent in support of its assertion that the self-interference cancellation device 112 (referred to as the “interference canceller 112” in the specification) is the corresponding structure:

A system according to the invention requires merely a self-interference cancellation device at only the more capable user device, and not at every user device in the network.

...

According to the invention, the interference canceler 112 compares a signal representing the composite signal  $S_1' + S_2 + S_3 + \dots + S_N$  and subtracts out a signal representing relayed source signal  $S_1'$  based on a best guess of the characteristics of  $S_1'$  and prior knowledge of the signal representing  $S_1$ , to obtain a signal representing  $S_2 + S_3 + \dots + S_N$ .

‘952 Patent, 3:45-49; 3:65-4:4.

Thus, according to ViaSat, the interference canceller 112 performs the “estimating” function of claim 6. Indeed, AST does not assert that interference canceller 112 is not tied to the “estimating” function by the specification. Rather, it argues that the interference canceller

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<sup>6</sup> However, the Court rejects AST’s identification of the claimed function, as it inexplicably replaces the claim language “said” with “the.” See Omega Eng’g, Inc. v. Raytek Corp., 334 F.3d 1314, 1321 (Fed. Cir. 2003) (stating “we must identify the claimed function ... staying true to the claim language and the limitations expressly recited by the claims”) (internal citations omitted).

1 112 is not sufficiently described because it is just a “black box,” and the specification fails to  
2 describe any details regarding structure. Of note, ViaSat has identified this “black box” as  
3 performing three additional functions recited in the claim, in addition to the “estimating”  
4 function: “storing,” “modifying,” and “subtracting.” See Dkt. 207, Revised Joint Claim  
5 Construction Statement, Ex. A. In response, ViaSat’s expert Dr. Steffes opines that there is  
6 sufficient structure in the ‘952 Patent – i.e., the interference canceler 112 – to allow a person of  
7 ordinary skill in the art (“POSITA”) to identify the structure corresponding to this means  
8 element. Dkt. 177, Ex. 7, Steffes Rebuttal Report ¶ 42. According to Dr. Steffes, a POSITA  
9 “would have understood what this interference canceller structure was, and would have known  
10 various ways to implement it, because that knowledge existed at the time the ‘952 patent was  
11 filed in 1998.” Id.

12 On this issue, Biomedino, LLC v. Waters Technologies Corp., 490 F.3d 946, 950 (Fed.  
13 Cir. 2007) is instructive. There, the patent recited a “control means for automatically operating  
14 valves.” The only references in the specification to the “control means” were a box labeled  
15 “Control” and a statement that the process of the invention “may be controlled automatically  
16 by known differential pressure, valving and control equipment.” Id. at 950. The Federal  
17 Circuit found that description insufficient under § 112, ¶ 6, even though plaintiff’s expert  
18 testified that known ways of operating valves existed at the time of the patent filing. It stated:  
19 “[t]he inquiry is whether one of skill in the art would understand the specification itself to  
20 disclose a structure, not simply whether that person would be capable of implementing a  
21 structure. ... Accordingly, a bare statement that known techniques or methods can be used does  
22 not disclose structure.” Id. at 953 (emphasis added).

23 In the present case, as in Biomedino, the ‘952 Patent fails to disclose a structure for the  
24 claimed “estimating” means, as it simply discloses a “black box” without further structural  
25 details. The reasoning behind Biomedino applies with even further force in this case, as the  
26 inventors of the ‘952 Patent did not include a statement in the specification, as the inventor had  
27 in Biomedino, that known equipment could be used to implement the function. As the Federal  
28 Circuit has explained, “§ 112, ¶ 6 requires some disclosure of structure in the specification

corresponding to the claimed means ... [W]hile it is true that the patentee need not disclose details of structures well known in the art, the specification must nonetheless disclose some structure.” Id. at 952 (internal citations omitted); see also Med Instrumentation and Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1211 (Fed. Cir. 2003) (“If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid [the price for use of the convenience of broad claiming afforded by § 112, ¶ 6] but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification. Such is impermissible under the statute.”) (brackets in original). Moreover, Dr. Steffes’ opinion that various known techniques could have been used to implement an interference canceller does not overcome the deficiency that no structure was disclosed in the specification. See Biomedino, 490 F.3d at 953 (“a bare statement that known techniques or methods can be used does not disclose structure”).

For these reasons, the Court construes this means-plus-function limitation as follows: the claimed function is “estimating channel characteristics of a roundtrip path to said relay station to obtain compensation parameters for said first one of said signalling devices”; the claimed function is construed to mean “determining approximate values of the four channel characteristics (delay, frequency, phase, and gain) to obtain compensation parameters for the first signalling device”; and the ‘952 Patent fails to disclose sufficient structure to perform the claimed function.

### 3. “MEANS ... FOR RECEIVING SAID SOURCE SIGNAL SEGMENT ...”

Term	AST’s Construction	ViaSat’s Construction
“means at each said signalling device for receiving said source signal segment from said relay station”	<u>Claimed function/construction of function</u> : receiving the same source signal segment from the relay station  <u>Structure</u> : Insufficient	<u>Claimed function/construction of function</u> : receiving said source signal segment from said relay station  <u>Structure</u> : receiving antenna 108 and receiver 110, including any I/O ports

1       AST proposes that the claimed function be clarified to state that “said source signal  
2 segment” means “the same source signal segment,” and that “said relay station” means “the  
3 relay station.” AST asserts that, when used to modify a term, “said” ordinarily refers to  
4 something already named or mentioned. Also, AST explains that it is seeking this construction  
5 because the claim language is otherwise ambiguous. In particular, AST notes that claim 6  
6 includes another “receiving” element, which recites a means “for receiving a composite signal  
7 segment from said relay station, said composite signal segment containing a representation of  
8 said source signal from each one of said signalling devices.” According to AST, the signaling  
9 device, therefore, receives two different signals related to the signal originally generated –  
10 “said source signal” and “a representation of said source signal.” AST asserts that its  
11 construction makes clear that “said source signal” must be the exact signal (“the same signal”)  
12 as the signal generated in the first claim element, as opposed to a “relayed” version of that  
13 signal which has been time-delayed and frequency shifted.

14       However, the specification does not support construing “said source signal segment” as  
15 “the same source signal segment” as the signal generated by the relay station. No such  
16 embodiment is disclosed. Rather, receipt of a “relayed” version of the source signal segment is  
17 disclosed.

18       According to the invention, a communication network is provided which consists  
19 of two types of links, a link in which a source-transmitted signal is cancelled at  
20 the receiver associated with the transmitter, so that the desired received signals  
21 can be extracted from a composite received signal, with the composite received  
22 signal consisting of the source-transmitted signal relayed from the relay station  
along with the desired received signals from one or more other users, plus  
additive noise; and the other in which no cancellation is performed on the  
received composite signal.

23       ‘952 Patent, 2:29-34 (emphasis added). Therefore, the Court rejects AST’s proposed  
24 construction of the claimed function.

25       Likewise, AST’s assertion that no corresponding structure is disclosed for the claimed  
26 function also fails because it is based on AST’s faulty construction of the function, i.e., that the  
27 ‘952 Patent never describes receiving “the same source signal” that has been transmitted.  
28 However, the ‘952 Patent does describe structures for receiving the relayed source signal. In

particular, Figures 4 and 5 each disclose a receiver 110 and receiving antenna 108, which are discussed in the specification and linked to this function: “[t]hrough the receiving antenna 108, the receiver 110 receives the composite signal ... (including the relayed source signal ...).” *Id.* 3:62-65 (emphasis added).

Therefore, the Court construes this means-plus-function limitation as follows: the claimed function, and the construction of that function, is “receiving said source signal segment from said relay station”; and the corresponding structures disclosed in the specification are receiving antenna 108 and receiver 110, including any I/O ports.

## B. THE ‘093 PATENT

### 1. “CORRECTION SIGNALS ...”

Term	AST’s Construction	ViaSat’s Construction
“correction signals for said time-delayed and phase rotated local near signal”	Two or more correction signals used to control the time-delay and phase-rotation imposed on a later representation of the local near signal to which no prior time delay or phase rotation has been applied	No construction required  <u>Alternatively:</u> Signals obtained from correlating that relate to the time-delayed and phase-rotated local near signal. The signals are used to adjust time delay and phase rotation of a later local near signal

The primary dispute between the parties is whether construction of this term should include the underlined limitations, as put forward by AST: (1) to control the time delay and phase rotation imposed on a later representation of the local near signal; and (2) to which no prior time delay or phase rotation has been applied.

With the language “to control the time delay and phase rotation imposed,” AST’s proposed construction encompasses the concept that the output of block 512 of the canceller module of Figure 5 is fed back into the time and phase detectors block 504. The specification explains that the time and phase detectors block 504 “performs correlation function(s) on its inputs and produces outputs that drive a time tracking loop block 506 and a phase tracking loop block 508.” ‘093 Patent, 6:21-34. These “outputs” are the “correction signals” that “drive” time tracking loop block 506 and a phase tracking loop block 508. Time tracking loop block

1 506 and phase tracking loop block 508 then “control” time delay block 510 and phase rotate  
2 block 512, respectively. See id. 6:35-49 (“down-converted local near signal is time-delayed by  
3 the time delay block 510, which is under the control of the time tracking loop block 506 ...  
4 [t]he time-delayed signal is then phase-rotated by the phase rotation block 512, which is under  
5 the control of the phase tracking loop block 508”) (emphasis added). Because the patent uses  
6 the term “control” to describe the function of the correction signals, the Court adopts AST’s  
7 proposed construction in this respect.

8 As for AST’s proposed language “to which no prior time delay or phase rotation has  
9 been applied,” AST asserts it is making clear that “correction signals are used to control the  
10 time-delay and phase-rotation imposed on a later segment of the signal that has not yet been  
11 time-delayed or phase-rotated.” AST Response Br. at 17-18 (emphasis added). In other words,  
12 under AST’s construction, it is required that the “local near signal” that is input to the  
13 downconvert block 514 of Figure 5 (and then into the time delay block 510 and phase rotate  
14 block 512) never have been time delayed or phase rotated before entering block 514. By  
15 contrast, under ViaSat’s construction, the input to block 514 is simply a “later local near  
16 signal,” without the requirement proposed by AST. AST has failed to cite any language from  
17 the claims or specification or anything from the prosecution history that requires that the later  
18 segment of the local near signal never have been time delayed or phase rotated before entering  
19 block 514. Rather, it simply argues that an absence of an embodiment showing that the local  
20 near signal is already time delayed and phase rotated supports its construction. At bottom,  
21 AST’s proposed language improperly narrows the claims beyond even the preferred  
22 embodiments disclosed in the specification.

23 As a final matter, the Court rejects ViaSat’s assertion that the claim language does not  
24 require construction, as the meaning of the claim language would not be clear to a jury, given  
25 its technical nature.

26 For these reasons, the Court rejects both parties’ proposed constructions and construes  
27 “correction signals ...” as follows: “signals used to control the time-delay and phase-rotation  
28 imposed on a later representation of the local near signal.”

**C. THE ‘017 PATENT**

**1. “SIMULTANEOUSLY TRANSMITTING SAID NEAR SIGNALS  
...”**

Term	AST’s Construction	ViaSat’s Construction
“simultaneously transmitting said near signals from said first device to said relay station”	Beginning and ending transmission of the near signals at the same instants of time	Plain and ordinary meaning; no construction required

The primary dispute between the parties is whether “simultaneously transmitting” the signals means that the beginning and ending of the transmissions must occur at the same instants in time. While ViaSat asserts that no construction is required, it also contends in its briefing that this phrase merely requires that the transmissions “overlap in time.”

The specification does not use the term “simultaneous” in describing the transmission of the near signals to the relay station. Rather, the specification simply explains that the individual near signals are “combined” to produce a multi-channel “IF transmit signal,” and the multi-channel IF transmit signal is translated to the RF transmission frequency and “broadcasted” via the transmit antenna. ‘017 Patent, 2:5-9.

Of note, the specification says nothing about transmissions beginning and ending at the same instants of time. Also, with respect to the prosecution history, the term “simultaneously” was added to the claims pursuant to a personal interview with the patent examiner to overcome rejections to the claims. As AST admits in its brief, “the prosecution history provides no record of precisely why the claims were allowed with this term added,” and the record of the personal interview is “terse” and does not explain the amendment. AST Response Br. at 20. Given the lack of guidance from the specification and the prosecution history, AST purports to rely on the “ordinary and customary meaning” attributed to the term “simultaneously” by one of ordinary skill in the art. AST submits the following definition of “simultaneous” from the Authoritative Dictionary of IEEE Standards Terms, 7th Edition, 2000: “pertaining to the occurrence of two or more events at the same instant of time. Contrast: concurrent.” (Emphasis added.) The word “concurrent” is defined as “pertaining to the occurrence of two or more



activities within the same interval of time, achieved either by interleaving the activities or by simultaneous execution. Synonym: parallel. Contrast: simultaneous.”

As noted by ViaSat, the IEEE definition of “simultaneous” does not specify what are the “events.” AST construes “simultaneously transmitting” as “beginning and ending transmission of the near signals at the same instants of time.” Thus, AST’s construction assumes that one “event” is a beginning of transmission and another “event” is an ending of transmission. However, it is equally plausible that an “event” is a transmission itself, and that two or more events are simultaneous transmissions occurring at the same instant (or even instants) of time, not necessarily starting and stopping together. ViaSat notes that Dr. Heppe, AST’s expert, conceded during his deposition that, according to the IEEE definition, transmissions could be “events” in a particular scenario. Dkt. 177, Ex. 11, Heppe Dep. Tr. 179:16-180:2; 181:11-23.

Therefore, the Court rejects AST’s proposed construction. Furthermore, because “simultaneously transmitting ...” is not used in a special manner by the ‘017 Patent, and because it could be understood by a jury without further construction, the Court finds that the plain and ordinary meaning applies to this term.

## 2. “MEANS FOR SIMULTANEOUSLY TRANSMITTING ...”

Term	AST’s Construction	ViaSat’s Construction
“means for simultaneously transmitting said near signals from said first device to said relay station”	<u>Claimed function:</u> simultaneously transmitting said near signals from said first device to said relay station (no dispute)  <u>Construction of function:</u> beginning and ending transmission of the near signals at the same instants of time  <u>Structure:</u> Insufficient	<u>Claimed function:</u> simultaneously transmitting said near signals from said first device to said relay station (no dispute)  <u>Construction of function:</u> plain and ordinary meaning  <u>Structure:</u> the multi-channel interference canceller 302, multi-channel IF transmit path 107, modem and multi-port signal combiner 112, IF MOD 1...M, signal splitter 413 and transmit path 108

1 For the reasons stated above, the Court finds that the plain and ordinary meaning applies  
2 to construction of the claimed function of “simultaneously transmitting.” Also, the Court  
3 rejects AST’s assertion that no structure is disclosed that performs the claimed function, as that  
4 assertion is based on AST’s erroneous construction of the function.

5 With respect to the disclosed structure, the specification explains that, in the context of  
6 Figures 1 and 3, near signals are transmitted to the relay station through the multi-channel  
7 interference canceller 302, multi-channel IF transmit path 107, modem and multi-port signal  
8 combiner 112, IF MOD 1...M, transmit path 108, RF transmitter 102 and transmit antenna 104:

9 Individual IF transmit signals 111 from a number, M, of IF modulators 110 are  
10 combined in a multi-port signal combiner 112 to produce a multi-channel IF  
11 transmit signal on the transmit IF path 107. The multi-channel IF transmit signal  
12 is translated to the RF transmission frequency by the RF transmitter 102 which  
13 then amplifies the signal and broadcasts it via the transmit antenna 104.

14 ...

15 The structure 302 receives the transmit IF path 107 from the multi-port signal  
16 combiner 112. The transmit IF path 107 contains the multi-channel IF transmit  
17 signal, which represents the Local Near (LN) signal. ... The structure 302  
18 outputs a continued transmit IF path 108 to the RF transmitter 102

19 ‘017 Patent, 2:1-8; 4:9-20. Thus, ViaSat’s identification of the corresponding structure is  
20 under inclusive, as it omits the RF transmitter 102 and transmit antenna 104.

21 Lastly, the embodiment show in Figure 4 adds signal splitter 413 as an additional  
22 structure that performs the claimed function: “The multi-channel IF transmit signal from the  
23 transmit IF path 107 is split at a signal splitter 413 into an extra copy of the multi-channel IF  
24 transmit signal and a plurality of signals 414. The extra copy of the multi-channel IF transmit  
25 signal is output from the multi-channel self-interference cancellation structure 302 on the  
26 continued transmit IF path 108.” Id. 4:58-64.

27 For these reasons, the Court construes this means-plus-function limitation as follows:  
28 the claimed function is “simultaneously transmitting said near signals from said first device to  
said relay station”; the plain and ordinary meaning applies to the construction of the claimed  
function; and the corresponding structures disclosed in the specification are the multi-channel  
interference canceller 302, multi-channel IF transmit path 107, modem and multi-port signal

combiner 112, IF MOD 1...M, signal splitter 413, transmit path 108, RF transmitter 102, and transmit antenna 104.

### 3. “SELECTIVELY GENERATING ONE OR MORE CANCELLATION SIGNALS ...”

Term	AST’s Construction	ViaSat’s Construction
“selectively generating one or more cancellation signals, each said cancellation signal having a frequency band corresponding to one of said shared frequency channels”	Using a decision process to identify each shared frequency channel and then generating a separate single-channel cancellation signal for each of the shared frequency channels only	Plain and ordinary meaning, <u>alternatively</u> : identifying each shared frequency channel and generating a cancellation signal for each of the shared frequency channels

The Court agrees with ViaSat that the patentee did not depart from the plain and ordinary meaning of the term “selectively generating.” The Court also rejects the underlined language, as put forward by AST in its proposed construction: (1) using a decision process to identify each shared frequency channel; and (2) then generating a separate single-channel cancellation signal for each of the shared frequency channels only.

This claim limitation addresses selective cancellation on multiple channels. As the ‘017 Patent states, other systems simply cancelled on every channel, whether or not shared, where cancellation might not have been necessary. ‘017 Patent, 4:23-28. The ‘017 Patent states that it improves on this by allowing channel selection: “A technique is needed for performing efficient selfinterference cancellation only on those channels where self-interference is present.” *Id.* 3:12-20.

Put simply, AST asserts that the claim language must be clarified to require that cancellation signals be generated only on the shared channels. AST’s argument is not persuasive. As noted by ViaSat, “selective” is a commonly understood term that means “applying to some but not others.” *See* Encarta World English Dictionary, p. 1624 (1999). Thus, the claim language “selectively,” read in connection with the specification (which explains that cancellation signals are generated only for shared channels) takes into account the

fact that cancellation is applied only to shared channels. Also, the claim language already ties a “cancellation signal” to a shared frequency channel only: “each said cancellation signal having a frequency band corresponding to one of said shared frequency channels.” (Emphasis added.)

Of note, in its briefing, AST does not explain why inclusion of the phrases “using a decision process to identify” or “separate single-channel” are necessary. Nor are those phrases used in the claim language or specification.

For these reasons, the Court finds that the plain and ordinary meaning of the term “selectively generating ...” applies, and this claim term requires no further construction.

#### 4. “MEANS FOR SELECTIVELY GENERATING ...”

Term	AST’s Construction	ViaSat’s Construction
“means for selectively generating one or more cancellation signals, each said cancellation signal having a frequency band corresponding to one of said shared frequency channels”	<p><u>Claimed function:</u> selectively generating one or more cancellation signals, each said cancellation signal having a frequency band corresponding to one of said shared frequency channels</p> <p><u>Construction of function:</u> using a decision process to identify each shared frequency channel and then generating a separate single-channel cancellation signal for each of the shared frequency channels only</p> <p><u>Structure:</u> Insufficient</p>	<p><u>Claimed function:</u> selectively generating one or more cancellation signals<sup>7</sup></p> <p><u>Construction of function:</u> Plain and ordinary meaning, <u>alternatively:</u> identifying each shared frequency channel and generating a cancellation signal for each of the shared frequency channels</p> <p><u>Structure:</u> multi-channel interference canceller 302, and specifically estimators 430 and 480, including any I/O ports</p>

<sup>7</sup> The Court rejects ViaSat’s identification of the claimed function – “selectively generating one or more cancellation signals” – as incomplete, as it omits the remainder of the functional language recited in the claim. See Cardiac Pacemakers, 296 F.3d at 1113 (“The court must construe the function of a means-plus-function limitation to include the limitations contained in the claim language .... It is improper to narrow the scope of the function beyond the claim language. It is equally improper to broaden the scope of the claimed function by ignoring clear limitations in the claim language.”) (internal citations omitted).

1 At the outset, AST argues that no corresponding structure is disclosed because none of  
2 the disclosed structures “selects” the shared channels as distinct from the unshared channels.  
3 Thus, according to AST, there is no structure that “selectively generates” the cancellation  
4 signals.

5 AST does not appear to dispute that the structures identified by ViaSat perform the  
6 function of “generating” a cancellation signal, without the selection function. Nevertheless, the  
7 Court finds that the “upconverter” blocks shown in Figures 4 and 6 must also be included in the  
8 identification of the corresponding structure. Specifically, the ‘017 Patent states: “estimator  
9 430 uses these signals to generate and output a baseband estimate 432 of the Relayed Near  
10 (RN) signal, in phase-inverted form, associated with the shared frequency channel. The  
11 baseband estimate 432 is upconverted at an upconverter 434 to produce a single channel IF  
12 cancellation signal 436 occupying the shared frequency channel”; “the estimator 640 uses these  
13 signals to generate and output a baseband estimate 642 of the Relayed Near (RN) signal, in  
14 phase-inverted form, associated with the shared frequency channel to which the *i*th stage 600  
15 corresponds. The baseband estimate 642 is upconverted at an upconverter 644 to produce a  
16 single channel IF cancellation signal 646 occupying the particular shared frequency channel.”  
17 ‘017 Patent, 5:20-23; 8:22-27 (emphasis added).

18 With respect to AST’s argument that the specification fails to disclose a structure that  
19 “selects,” ViaSat states: “if the Court finds that additional structures are necessary, the  
20 ‘controller unit’ can be added to the structure.” ViaSat Reply Br. at 14. The “controller unit”  
21 is described in the ‘017 Patent as follows:

22 The multi-channel self-interference cancellation structure 302 may incorporate  
23 dynamic re-assignment of shared frequency channels. By using a controller unit  
24 (not shown) connected to the downconverters 410, downconverters 416,  
25 downconverters 426, and upconverters 434, the frequency spectrum location of  
26 each shared frequency channel can be changed by simply controlling these  
27 downconverters/upconverters to perform downconverting/upconverting  
28 according to newly defined frequency shifts. Accordingly, shared frequency  
channels can be redefined without requiring any physical modification of  
equipment by a technician. The flexibility of the multi-channel self-interference  
cancellation process is thus dramatically improved.

‘017 Patent, 7:11-19 (emphasis added).

1 In response, AST asserts that the controller unit is not sufficiently described, as the  
2 specification fails to describe any details regarding its structure. On this issue, the Federal  
3 Circuit has provided the following guidance in the context of a claimed “controller”:

4 the figures of the ‘763 patent show the controller’s circuit as a black box, i.e.,  
5 nothing in the figures describes the details of its inner circuitry. “[H]owever, the  
6 absence of internal circuitry in the written description does not automatically  
7 render the claim indefinite.” .... the specification need only disclose adequate  
8 defining structure to render the bounds of the claim understandable to an  
9 ordinary artisan. [citation omitted] (holding that the internal circuitry of an  
10 electronic device need not be disclosed in the specification if one of ordinary  
11 skill in the art would understand how to build and modify the device). Here,  
12 [plaintiff’s expert] testified that an ordinary artisan would know how to interpret  
the specification and actually build a circuit. The record shows that an ordinary  
artisan would have recognized the controller as an electronic device with a  
known structure. Therefore, the specification along with the figures shows  
sufficient structure to define the claim terms for an ordinarily artisan in the  
relevant field.

13 Telcordia Techs., Inc. v. Cisco Sys., Inc., 612 F.3d 1365, 1377 (Fed. Cir. 2010); see also  
14 Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc., 412 F.3d 1291, 1302 (Fed.  
15 Cir. 2005) (“while it is true that the patentee need not disclose details of structures well known  
16 in the art ... the specification must nonetheless disclose some structure”); Biomedino, 490 F.3d  
17 at 950 (“[w]hile the specification must contain structure linked to claimed means, this is not a  
18 high bar: [a]ll one needs to do in order to obtain the benefit of [§ 112, ¶ 6] is to recite some  
19 structure corresponding to the means in the specification, as the statute states, so that one can  
20 readily ascertain what the claim means ....”) (internal quotations omitted, brackets in original).

21 Here, the ‘017 Patent explains that a “controller unit” connected to the downconverters  
22 410, downconverters 416, downconverters 426, and upconverters 434, can be used to change  
23 the frequency spectrum location of each shared frequency channel by controlling these  
24 downconverters/upconverters to perform downconverting/upconverting according to newly  
25 defined frequency shifts. ‘017 Patent, 7:11-19. Like the “controller” in Telcordia, expert  
26 testimony has been submitted by ViaSat indicating that the controller unit of the ‘017 Patent is  
27 a known structure that can perform the claimed function. See Dkt. 195-1, Ex. 2, Steffes Dep.  
28 Tr. 146:6-151:18; 150:4-8. Also, the ‘017 Patent describes additional structural details of the

controller unit, specifically, that it is connected to the various downconverters and upconverters.

As such, the Court rejects both parties' proposed constructions and construes this means-plus-function limitation as follows: the claimed function is "selectively generating one or more cancellation signals, each said cancellation signal having a frequency band corresponding to one of said shared frequency channels"; the plain and ordinary meaning applies to the construction of the claimed function; and the corresponding structures disclosed in the specification are multi-channel interference canceller 302 of Figure 3, and specifically: (a) estimator 430 and upconverter 434 of Figure 4, and "controller unit" connected to upconverter 434, including any I/O ports; (b) estimator 480 and upconverter 484 of Figure 4, and "controller unit" connected to upconverter 484, including any I/O ports; and, as an alternative embodiment as shown in Figure 6, (c) estimator 640 and upconverter 644 of Figure 6, and "controller unit" connected to upconverter 644, including any I/O ports.

#### 5. "MEANS FOR RECEIVING ..."

Term	AST's Construction	ViaSat's Construction
"means for receiving at said first device a composite signal from said relay station"	<u>Claimed function/construction of function</u> : receiving at the first device a composite signal from the relay station <sup>8</sup>  <u>Structure</u> : antenna and RF	<u>Claimed function/construction of function</u> : receiving at said first device a composite signal from said relay station  <u>Structure</u> : receive IF path 109 and multi-port signal splitter 402 included in interference canceller 302

The parties primarily dispute the identification of the corresponding structures disclosed in the specification for performing the claimed function. Based on a review of the specification, the Court finds that the structures collectively identified by both parties correspond to the claimed function. Specifically, the '017 Patent describes the receive IF path 109, multi-port signal splitter 402 included in interference canceller 302, RF receiver 106 and

<sup>8</sup> Again, the Court rejects AST's identification of the claimed function, as it inexplicably replaces the claim language "said" with "the."



1 receive antenna 108 (or, alternatively, transmit antenna 104) as performing the “receiving”  
2 function:

3       The RF receiver 106 may share the transmit antenna 104, or it may have a  
4       receive antenna 108 of its own. The RF receiver 106 performs the  
5       complementary function to the RF transmitter 102, outputting a multi-channel IF  
6       received signal via the receive IF path 109 to a multi-port signal splitter 114 that  
7       distributes individual IF receive signals

8       ...

9       FIG. 4 illustrates one embodiment of the multi-channel self-interference  
10       cancellation structure 302, in a parallel configuration. The multi-channel  
11       composite IF received signal from the receive IF path 109 is split at a signal  
12       splitter 402 into a plurality of signals 404 and a direct path signal 406.

13 ‘017 Patent, 2:9-14; 4:40-45 (emphasis added).

14       Therefore, the Court construes this means-plus-function limitation as follows: the  
15       claimed function, and the construction of the claimed function, is “receiving at said first device  
16       a composite signal from said relay station;” and the corresponding structures disclosed in the  
17       specification are receive IF path 109, multi-port signal splitter 402 included in interference  
18       canceller 302, RF receiver 106, and receive antenna 108, or, as an alternative to receive  
19       antenna 108, transmit antenna 104.

20 **V.     CONCLUSION**

21       For the foregoing reasons, and for the reasons stated on the record at the claim  
22       construction hearing, the Court construes the disputed claim terms of the patents-in-suit as set  
23       forth above.

24       IT IS SO ORDERED.

25       Dated: February 9, 2011

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27  
28  
\_\_\_\_\_  
*Saundra B. Armstrong*  
SAUNDRA BROWN ARMSTRONG  
United States District Judge